

Chapter 2

Waste Diversion and Recycling

An important component of any efficient, integrated solid waste management system is a process for diverting materials out of the Municipal Solid Waste (MSW) stream through recycling and source reduction. In 1994, DSWA established a goal of “recycling and reusing 35 percent of household solid waste discards through material markets by 2001”.¹ The state appears to have substantially missed this goal.² Many states have mandatory recycling legislation in place. Delaware does not.

Source reduction, recycling, and other methods of materials recovery can and should be important components of an integrated solid waste management strategy focused on preserving Delaware’s limited landfill capacity, particularly in New Castle County. Appendix F contains an assessment by one of the Working Group members of the types of improvements that might be made in Delaware’s current efforts.

A study conducted in 2004 on behalf of the Delaware Recycling Public Advisory Council underscored the assertion that recycling can make good economic sense.³ It concluded that implementation of efficient recycling systems in New Castle County (integrated collection of recyclables and refuse in incorporated areas and organized county-wide collection in unincorporated areas) would lower overall solid waste management costs for households in that county.

Recycling makes environmental sense as well. Numerous studies comparing the environmental costs of recycling to the environmental costs of landfilling show that recycling generates net environmental improvements while land filling generates net environmental costs.⁴ Most of the benefits result from the fact that recycling materials avoids the substantial environmental costs involved in extracting and processing virgin materials, including the energy consumed in those processes. These benefits, of course, would not be experienced within the state of Delaware since most of the materials it consumes are manufactured elsewhere. Nevertheless, they are benefits to the country, and Delaware should not limit its concerns for environmental improvement to its own borders.

The prospects for diverting wastes from the MSW stream through recycling (and thereby extending the life to the state’s landfills) are not trivial. Table 2.1 summarizes the Working

¹ DSWA, “Statewide Solid Waste Management Plan”, May, 1994, p. 49.

² See Franklin Associates, Ltd., “Assessment Of Delaware Solid Waste Discards In 2000 And The Potential For Recycling Of Materials”, prepared for DSWA, September 2002. This report estimates that, depending upon what definition of MSW is used, Delaware was recycling 21% or 23% of its MSW in 2000.

³ DSM Environmental Services, Inc. “Evaluation of Enhanced Residential Waste and Recyclables Collection and Processing for New Castle County”, a report prepared for the Delaware Recycling Public Advisory Council, October 15, 2003.

⁴ See, for instance, Barlaz et al., “Comparing Recycling, Composting and Landfills”, BioCycle, September and October 2003.

Group's assessment of what these prospects could be assuming mandatory programs.⁵ It indicates that an effective recycling program could divert as much as 250,000 of waste a year that are now going to the state's landfills. A more effective source reduction program could increase this diversion rate. In the Working Group's judgment, the question should not be whether these programs should be established, but how they should.

Table 2.1 Potential for Diverting Waste Materials From Delaware Landfills					
Type of Waste	Source¹	Percent of MSW	Current Diversion as a % of MSW	Percent(3) that Could be Diverted	Potential Diversion as a % of MSW
Yard trimmings ²	R,C	19%	7%	79%	15%
Commercial	C	34%	15%	50%	17%
Residential recyclables	R	25%	3%	49%	12%
Durable goods	R	10%	<1%	30%	3%
Food Wastes and other	R,C	12%	<1%	33%	4%
Total		100%	25%		51%
Notes: 1. R = residential; C = commercial 2. The potential diversion of yard trimmings includes off-site processing (12%) and on-site management by mulching, grass cycling, and backyard composting (3%) 3. Working Group's estimates, except for yard waste, DSM 2004 report					
Sources: Based on estimates contained in Franklin Associates (2002), DSM (2003), and DSM (2004)					

As Table 2.1 indicates, one significant opportunity for diverting wastes from landfills is in the area of yard trimmings. It is estimated that these account for almost 20 percent of the wastes currently being landfilled.⁶ A study undertaken for the DSWA estimated that about 95,000 tons of residential dwelling yard trimmings were being disposed of at DSWA landfills in 2003.⁷ Commercial enterprises such as landscapers and tree service companies were generating another 47,000 tons, but most of this – about 37,000 tons – was already being diverted from the state's landfills.⁸ This report concluded that a yard waste ban would essentially eliminate this flow. It estimated that such a ban, for instance, would result in homeowners mulching or composting about 20,000 tons of these wastes in their own backyards.

⁵ The potential recycling rates shown in Table 2-1 are higher than previous studies for Delaware have estimated (see for instance, DSM Environmental Services, Inc., 2003, *op. cit.*) but none of the previous studies have evaluated a mandatory recycling program.

⁶ The Franklin Associates study estimated a higher percentage, 26 percent. *op. cit.*

⁷ DMS Environmental Services, Inc., "Analysis of the Impact of a Yard Waste Ban on Land fill Quantities and Household Costs", prepared for DSWA, September 15, 2004.

⁸ *Ibid.* The 10,000 ton difference between the amount generated and the amount disposed of in DSWA landfills is a rounding up of the 8,840 ton number included in this report, referencing a 1997 estimate.

DNREC established a yard waste committee in 2005 to consider this proposal. In December 2005, the committee endorsed this approach and issued a series of “consensus points” (See Box 2.1).

The potential for further diversion and recycling of commercial waste is less clear. A study currently being undertaken for DSWA is apparently finding that the amount of diversion and recycling of commercial wastes is already significant.⁹

The Working Group heard a presentation about the innovative and successful source reduction and recycling programs established by the state of Massachusetts in cooperation with the state’s business community. These programs provide information, incentives, and peer-to-peer technical assistance to assist commercial and industrial establishments in reducing their waste generation and waste management costs. Delaware could benefit from the experience programs such as these have had in determining what works effectively in diverting commercial waste. Appendix F also contains some suggestions about what more could be done here.

One opportunity that has been largely neglected is recycling at government buildings and other government facilities. If the state wants to encourage recycling among its residents and commercial enterprises it should be showing the way – but it is not.

Much attention has been given to how the rate of residential recycling could be increased. A study of alternative voluntary approaches in New Castle County concluded that the rate could be increased from the existing rate of 6 percent, utilizing DSWA’s Drop-Off program, up to 21 percent for a refuse collection program that collected commingled recyclables on a weekly basis and charged residents a per unit fee for the collection of their non-recycled refuse.¹⁰ The option that resulted in the “lowest cost per ton and the highest recovery of material” was a weekly, single stream, curbside collection program.¹¹ The consultant estimated that such a program would result in a 19 percent recycling rate at a cost of \$136 per ton.

One program that the Working Group reviewed that appears to have some significant promise in providing better incentives to households to participate in recycling is the RecycleBank program. RecycleBank began operating in Philadelphia about a year ago and has recently extended its operations into New Castle County.

This operation was started by a Columbia Business School graduate who clearly understands incentives. Households are credited with RecycleBank dollars related to the amount of materials they recycle. These dollars can be converted into coupons that can be redeemed for cost savings at area stores. Thus the household is financially rewarded for its recycling efforts rather than having to pay for it. The reported result of this shift in incentives is impressive – low and middle-income neighborhoods in Philadelphia that traditionally had very low recycling rates suddenly jumped to participation levels over 70 percent.

⁹ The study is being undertaken by DMS Environmental Services, Inc., and the report is due in May 2006.

¹⁰ DMS Environmental Services, Inc., (2003)

¹¹ Single stream means that the recyclable materials are all combined together rather than being separated by type of material.

Box 2.1**Yard Waste Management Committee Consensus Points**

Under the leadership of Governor Ruth Ann Minner the Department of Natural Resources and Environmental Control established the Yard “Waste” Management Committee (“Committee”) to advise the State on the effects of banning yard “waste” from disposal, as proposed in Senate Bill 225. These issues include educating various segments of the population on sustainable behavior and how to best manage their yard “waste,” the capability of the private sector to manage the material that would be diverted from the landfills, and the marketability of the products made from the diverted material. The Committee met four times between August and December of 2005 and established subcommittees to evaluate yard “waste” collection, processing, marketing, and education. In addition, the Committee reviewed guidance drafted by DNREC for the design and operation of composting facilities², considered the effect of a ban on homeowners and businesses, identified zoning and land use issues, made recommendations regarding enforcement, and considered the yard “waste” elements of Senate Bill 225.

To help respond to questions from legislators and their constituents concerning the impact that a proposed ban on yard “waste” disposal would have on Delaware residents and businesses, the Committee endorses the concept of such a ban and agrees to the following points:

- Yard trimmings are a valuable resource and should be diverted from disposal;
- A ban on the landfilling of yard trimmings would require only modest changes by homeowners and businesses;
- No significant changes to collection systems are expected to be required;
- Yard trimmings can be converted into useful products;
- More than sufficient markets exist for high-quality compost;
- An effective public education campaign should be implemented;
- Enforcement Should be a Tool of Last Resort; Emphasis Must be on Education
- Zoning and Land Use Requirements Allow Opportunity for Mulching and Composting Operations to Become Established
- The Committee Supports a Yard Trimmings Ban as has been Enacted and Implemented in 23 Other States

A ban on the disposal of yard trimmings, if properly implemented and supported, will benefit the citizens of the state by increasing the life of our landfills, providing new or expanded business opportunities, returning valuable resources to the soil, making high-quality home-grown compost available to homeowners, and in general improving the sustainability of our lifestyle.

The incentive for businesses to participate in the program is that they get some good publicity and have a link into new customers. Using some of their advertising budget as well as the money they traditionally spend on in-store specials to finance these coupons gives them a stronger link to new customers than is provided from traditional advertising and special offers. Thus they face a positive incentive to participate, and the more valuable their coupon, the stronger the attraction to new customers.

The collectors also have an incentive to participate similar to that which exists with commercial customers. RecycleBank operates in association with a materials recovery company, Blue Mountain Recycling, and they jointly ensure that there is a MRF conveniently available to the areas served by the program. Every ton of materials that the RecycleBank program diverts from the waste stream saves the collector the collection cost and tipping fee for that ton, allowing the collector to offer collection services more competitively. The collector is willing to pay RecycleBank for collecting and disposing of the recyclables as long as these payments are less than the associated cost savings.

It is probably too early to assess the long-term viability of this business model, but it does seem to have the incentives right. The model could also work in areas where there is municipal collection, although collection services offered by local governments are often less sensitive to incentives than private collectors. Collectors given a monopoly to serve an area are also likely to be less responsive to these incentives because they are not in a competitive market.

Conclusions

There are a number of things that Delaware can do to reduce the amount of MSW generated and divert these wastes from the state's landfills. These programs can generate substantial economic and environmental benefits. If successfully implemented, they will significantly help extend the useful life of the existing landfills significantly. But they also require commitment and planning and resources.

These programs would be particularly advantageous in Northern Delaware, which is facing some serious limitations on its landfill capacity. But they would be beneficial in the rest of the state as well. It is also worth pointing out that these programs are compatible with all the MSW processing systems the Working Group reviewed, and some of these processes indeed require that these materials be removed in order for: a) the process to operate at maximum efficiency and b) for the end products to have a viable market.